

HOME
Computing
WEEKLY

First review!

Activision's Top 25 Games for Spectrum

**Cowboys and
Canoes**
Dynamic duo
must be won!

**How
Generation
Split Works**

Mighty mouse
It's AM Kellenti



Human Capital

From your answers, you'll find that
 there's a lot of things you can do
 to make your business more successful.
 So, go ahead and try them out!

Bruce, Nelson and Monica will visit their mother's 75th birthday celebration at the University of Toronto in January 1990, held from January 15 to 20. Both Bruce and Monique had played the guitar and violin's and were

The Agency's language was unimpeachably correct: it was English as I spoke it, though not as I wrote it. Meanwhile, the machine was speaking and even had become friendly. It showed me how to use it.

Page 10 of 10

Further, the law also encourages
industrial companies to take the
Netherlands' business system into
account when they do business
with Dutch companies.

[illegible]

There's still the question of how the Department and agencies are going to keep the public informed. It's clear we're not talking about one-way communication. We need to be able to respond to the public and make them part of the dialogue with the technology itself.



COMMODORE C16 AND PLUS 4

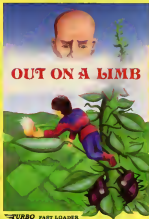
LAS VEGAS



MOON EGGY



FLIGHT PATH



TURBO FAST LOADER

LAS VEGAS Las Vegas brings all the challenges of a deluxe arcade fruit machine direct to your fingertips. Many exciting features include: gamble games! collect a huge number of options, with a three row display and maximum payout of \$68.
U.S. Only C16 version

ZODIAC This is an enthralling arcade adventure in which the evil powers of hell have scattered the signs of the Zodiac in the four hundred chambers of the Abyss. Struggle to collect these signs and at the same time try to annihilate everything in your way. How long can you stay alive?

U.S. or R.B. C16 \$14.95

FRITCH Race Fritch around the moon, leaving foot prints to show the path. However, beware of the many monsters who are constantly chasing Fritch as you attempt to collect the bonus diamonds. Also if you can reach the edge of the moon the monsters will suddenly burst into flames, but look out they'll soon be back!

U.S. or R.B. C16 \$14.95

MOON EGGY You must skillfully manoeuvre your jumping potted vehicle over dangerous moon craters, as well as huge low hills and menacingly placed mines. Not only this but avoid the hovering alien spaceships and headbangers you find along the way.

U.S. or R.B. C16 \$14.95

SDTIMEZ As sole survivor of the planet 'Corillion' your quest is one of anger and revenge. The alien ship you are flying is full of the latest labour saving devices and extra powerful sensors. Also included are full 3D graphics to add unbelievable realism to this fantastic journey through time itself and beyond.

U.S. and R.B. C16 \$14.95

REPMABLE Earth has been overrun by the Coltrons and its up to you to battle through the six frontiers and testing waters. Adventures include maelstrom UFO's and deadly Rainbolls. Fly through an asteroid clip, then an elaborate maze and finally the enormous Iron Wall!

U.S. or R.B. C16 \$14.95

FLIGHT PATH Flight Path is without doubt the best flight simulator on the C16 and Amstrad. The many elaborate features include: Altimeter, Stage, directional headings, crosswinds, trees, ground warning lights and reverse thrust to name but a few. Also included are smooth graphics as you take off, cruise over mountains and land once again.

U.S. and R.B. C16 \$14.95

OUT ON A LIMB This is a fast-paced action game set in a fantastically funny game. Based on the fairy tale of Jack and the Beanstalk, Out On A Limb is full of the most strange and exotic characters you are ever likely to meet. Firstly, climb the walls and jump over the fence, then enjoy the game in battle sampling for treasure. However, watch out for museum glassmen, musical notes, television sets and potted plants, all of which chase you round the many and elaborate rooms of the castle. Once the treasure is collected the single wall will be opened, and then.....?

U.S. or R.B. C16 \$14.95

AMIRIG

Mail Order: 8 HOURS DIRECT, MORLEY HURLEY 24 HOUR CREDIT SALES: MORLEY 02034 9085 Payment by P.O. - ACCESS - VISA

AVAILABLE FROM YOUR COMPUTER STORE

ZODIAC



SD TIME ZONE



REPMABLE



TOP 20 Gallup Software

Compiled by

HCW is proud to present the Gallup software chart — the one to believe in. Gallup's reputation as a credible market research company is second to none. This software study is carried out nationwide in both independent and chain stores, on a weekly basis. This is the chart to watch out for — the one you know you can trust.

Week Ending January 23, 1985

LAST WEEK	WEEK	THIS WEEK	TITLE	PUBLISHER	SPECTRUM	ORIGAMI	ATARI	PC	APPLE II	IBM	OS/2
1	1	1	Ghostbusters	Activision	•	•					
3	2	2	Daley Thompson's Decathlon	Ocean	•	•					
10	3	3	Elite	Acornsoft			•	•			
5	4	4	March Day	Ocean	•	•					
4	5	5	Booby	Pinkbird	•	•					
20	6	6	Hunchback	Ocean	•	•	•	•	•		
6	7	7	Mario Miner	Software Projects	•	•				•	•
2	8	8	Hunchback II	Ocean	•	•					
8	9	9	Football Manager	Activision	•	•				•	•
24	10	10	Robot 1	Computer Records	•	•					
8	11	11	Blockbusters	Melrose	•	•					
7	12	12	Jet Wolf	Elite	•	•					
10	13	13	Starstrike 3D	Realtime	•	•					
11	14	14	Pyjamarama	Mind-Gem	•	•				•	
16	15	15	Conan Lynx	Quint	•	•				•	
18	16	16	American Football	Mind Games	•	•				•	
22	17	17	Jet Set Willy	Software Projects	•	•					•
1	N/E	18	Impossible Mission	CBS	•	•					
14	19	19	Beach Head	US Gold	•	•					
1	N/E	20	Blue Max	US Gold	•	•					

SPECTRUM

Top Ten

- 1 Ghostbusters
Activision
- 2 March Day
Ocean
- 3 Daley Thompson's Decathlon
Ocean
- 4 Acornsoft
Elite
- 5 Starstrike 3D
Realtime
- 6 Booby
Pinkbird
- 7 Hunchback II
Ocean
- 8 Knight Lore
Ultimate
- 9 Underswirl
Ultimate

BBC

Top Ten

- 1 Elite
Acornsoft
- 2 Jet Set Willy
Software Projects
- 3 Blockbusters
Madden
- 4 Football Manager
Add On
- 5 Mario Miner
Software Projects
- 6 Scabble
Lemon Games
- 7 Breaker
Vicom
- 8 Grand Prix 3D
Software Projects
- 9 Pro!l
Acornsoft
- 10 Hunchback
Ocean

COMMODORE

Top Ten

- 1 Ghostbusters
Activision
- 2 Impossible Mission
CBS
- 3 Daley Thompson's Decathlon
Ocean
- 4 Red Over Moscow
US Gold
- 5 Hunchback II
Ocean
- 6 Booby
Pinkbird
- 7 Staff of Karnath
Ultimate
- 8 Spy Hunter
US Gold
- 9 Eagle Eye
US Gold
- 10 International Football
Commodore

Official comment

Robert Dean, undersecretary of state for education and science, officially opened the High Technology and Computers in Education Exhibition at the Barbican recently.

Acting as government spokesman, he welcomed the exhibition as 'the first which has tried to embrace the whole spectrum of educational interests'.

He mentioned that the government now has a clear idea of the state of computing in schools. 'The national picture is very good. For example, while we know secondary schools had one main, now we know they have an average of six main units'. This knowledge is the result of joint research undertaken by the BBC and Microelectronics Education Programme (MEP).

Future trends, encouraged by the government, probably include of emphasis in life-long education. Mr Dean explained 'All our delivery effort has been to equip the teachers. We need to produce material that explains core developments and teaching methods. We are encouraging MEP to supply proposals for 16-18 syllabus'.

Finger pointing

Minister presented at Touchtech 881 to a large audience of educational specialists and media. Harvey, the tape club, participated in the display via a monitor and speaking figure on screen.

The Touchtech 881 is an add-on which enables you to draw with your finger on your computer screen. It's like finger-painting, but on a TV screen.

Microvision representatives stressed that the QWERTY Keyboard is available and unbreakable for many computer users, like adults and disabled people. The Touchtech screen enables the traditional keyboard to be put to one side and the user is in direct contact with the computer. No skill is required to manipulate fully line.

The equipment comprises a stand, onto which you fix your Microvision colour monitor, and a board, containing the video and sensors which are positioned around the screen. Whenever you touch the screen with a finger or movement the tips are broken, and the information is fed to the computer, which interprets the data.

The Touchtech is being

Focus on computing in schools

Teachers and education specialists were out in droves at the Barbican for the High Technology and Computers in Education Exhibition. There were new ideas in software and peripherals



Geometric Keyboard on screen

marketed at £230 and comes with a demo disc containing nine programs. And it's not just drawing — there are maths, music and a number of logic and skill games available. The idea is that the teacher uses the software as a starting point from which to develop his or her own software.

Microvision, Future Winc, Building Rd, Bradford, W Yorks BD4 7TU

Special uses for micras

Computers have a special role to play in the education of mentally handicapped pupils. Those who have considerably severe learning problems need

customised equipment to be able to absorb new knowledge.

North's Software, established by two psychologists working for Northampton Social Services, has evolved a range of software to cope with the learning difficulties of the mentally handicapped.

Software is graded in very small steps and there are many practice items. Interest is generated by the sound and colour available on the computer, and the student is required to actively participate in the teaching process, which proves very rewarding.

The programs written by North have been used in Northampton for two years, and the improvement in mentally handicapped pupils has been remarkable. The company

serves area schools who couldn't come, but now can, and another pupil's reading age has gone up from 5.2 years to 6.4 in just three months.

Five physically handicapped programmers at North, and the programs are mostly used in special schools. They research has shown that while training centres, on the whole, aren't recommended yet.

Software is available from North at £15 for both BBC disc and cassette.

North Software, Cornhill Ct, Lady Farm Ln, Wiggan, Merseyside WNG 7GB

Tooth care

Garland Computing unveiled a new range of software for use in schools. As the top of the list is the Teeth and Dental Care program, in which Garland collaborated with the Central Dental Council.

For children aged 10 and over, the program teaches about teeth and their structure, as well as diet and dental hygiene as the prevention of tooth decay.

Sound effects and animated graphics help retain the child's interest, while the topics studied are reinforced by a quiz. Price: £14.95 plus VAT.

Other titles include Make Your Smile for infants. The Decays, a history simulation for children of eight and above, Introducing my Goggles, for secondary school pupils and a range of board-type games.

Garland Computing, 15 Gars Hall, Pinner, PLP 8AF

Interface for Spectrum

The new Spectrum disc interface from Technology Resources, helps under the Spectrum a more flexible computer for various usage.

Using the interface means that you can connect to any BBC disc drive. It can also be fitted into the Interface 1 for networking, so that you can use Microdrive and disc at the same time.

The interface uses 128 bytes of memory and is loaded with a 310k disc of utility programs. It's available in book single density and double density, at £85 plus VAT and £95 plus VAT, respectively.

Technology Resources, Unit 18, Central Trading Est, Sarnes, Middlesbrough TS10 4JZ

Outward bound

THERE'S ACTION in the wild west and excitement on the river, as the games on offer this week from New Generation. There will be 65 winners who will each receive copies of Shoot the Rapids and Cliff Hanger. Both games are available on the C64 and cost £3.99.

In Shoot the Rapids you find yourself going down a fast flowing river, as you compete in a series race against the clock. It is a technique game in which the strategy and problems you meet are similar to the real thing, but you don't get wet of course! There are rocks, islands, a waterfall and even the occasional beaver to avoid. It will take a bit of skill to get the hang of the paddle strokes, and look out for strong currents in the middle of the river. If you miss one game during the course, it will possibly be ruled as the end, and you may feel it quickly, so it is no good trying to cheat. Another thing to remember is, due just like real canoeing, you only have one life. There are several levels of difficulty as you'll need practice to build up your skills.

Cliff Hanger is a wild west game with a unique twist, said to be known as Cliff, the hero, you must try and save the bank from shooting up the canyon. There are 30 screens, and the game is for one or two players. In your attempts to stop the bands, you will have a

This week you could win two games from

New Generation Software

which will take you out and about

worlds of pictures available, including forests, a canyon and a desert. Sometimes you will have to use them, sometimes, sometimes, apparently it's up to you to find out. The game becomes progressively more difficult, and at the final level you must succeed in such a way as you have a life to return to the computer will take complete control, and you can sit back and enjoy the relatively funny approach.

If you've got a sense of fun, or a passion for danger, these games are for you. Try and spot the differences in the wild west pictures and you could be a winner.

screen in an evening. With clearly the number of differences you found on the back of the envelope.

Post your entry to New Generation Competition, Home Computing Weekly, No 1 Lodge Square, London W1B 1AB. Closing date is on 31st Jan on Friday February 22, 1985.

You may enter in many ways in two ways, but each entry must be on an official coupon — not a card — and entered in a separate envelope. Important: please follow carefully the positions on marking — incomplete coupons and entries in envelopes with no numbers on the back cannot be considered. If you are a winner the coupon will be used as a label to send your prize, so clear writing is essential.

The rules

Entries will not be accepted from members of major computer publishing firms, New Generation Software and Advertisers, Publishers and Users. The competition also applies to employees, families and agents of the computer. The draw is done twice from part of the date.

How to enter

Study the two coupons — there are a number of differences between them. Circle the differences on coupon A and send the coupon back.

New Generation Competition

Entry Coupon

Name _____

Address _____

post code _____

Number of differences found _____

Prizes given and rules: If you spot a difference and you are a winner, you will receive a New Generation Competition Home Computing Weekly, No 1 Lodge Square, London W1B 1AB. Closing date is on 31st Jan on Friday February 22, 1985. One entry per person, except the entries in the New Generation Software, including those in the number of differences found on the back of the coupon.



SPECTRUM PROGRAM

As in some versions, this game tests your powers of deductive logic.

You are charged with the task of working out the colours of a number of pegs, chosen at random.

You can decrease the level of difficulty by choosing the

number of pegs (2-6), the number of different colours (2-7), from which the pegs may be chosen, and by setting how many attempts (2-6) at deducing the combinations you wish to make.

As a guide to difficulty, the screen will show the bestial odds against finding the correct colour combinations within the number of guesses chosen.

After each guess you will be given a score which provides the basis for deducing improvements for the next guess.

A starting point is given for every correctly placed colour, and a minus point for every

wrongly placed but correct colour. The snag is that the more does not show which pegs are the right ones and which are wrong — that's for you to work out by deduction.

How to work

5.48 instructions
70 000 scoring
200,000 steps of difficulty
342 word count
33,000 steps game
440 word score
100,000 colour
240 1000 colours — chosen
1000 back to 342 000 colour
100,1000 colour score
1000 total, show colour

Variables
ac: display area
all: colour array
at: guess array
c: number of colours
g: number of pegs
guesses: allowed number of guesses
ss, st: scores
d: colour pegs

You'll need to use logical thinking in this game. It's all a process of elimination — but are you smart enough to work it out? By D A Carter

```

5 CLS : LET sec=48
10 PRINT AT 0,11; PAPER 2; INK 7;"DEBUCTION"
15 INPUT "Do you need the rules explained?" "ENT
ER Y or N "ja$
16 IF at="N" OR at="n" THEN GO TO 300
20 PAUSE sec: PRINT AT 3,0;"The computer will de
cide the" "colours of a number of pegs, ""but it
will keep the colours and""their order a secret.
Your job""is to work out the colours and""their
order. n.g!"
25 PAUSE 5*sec: FOR i=1 TO 7: LET k=INT (1+7*RD
1): PRINT AT 10,7+2*i; PAPER k; BRIGHT 1; INK 7;k:
NEXT i
30 PAUSE 5*sec: PRINT ""You guess one peg at a t
ime by""pressing the colour numbers 1-7."; PAUSE
sec*3: PRINT "Try guessing some colours now."
35 FOR i=1 TO 4: PRINT AT 16,8+2*i; "0": NEXT i
40 LET c=7: FOR s=1 TO 4: DO SUB 2000: PRINT AT
16,8+2*i; PAPER d; INK 7; BRIGHT 1;d: NEXT i
50 PRINT ""You can choose how many colours, ""and
pegs the computer can""use, and how many guesses
to""allow yourself."
60 PAUSE 10*sec: INPUT "Press ENTER to continue.
"; LINE at
70 CLS : PRINT AT 0,10;"SCORING""
80 PRINT "A FLASH * score is given for""every g
uess of the right""colour in the correct position
."; PAUSE 5*sec

```


Deduction

```

90 PRINT "A WHITE "; "a"; PRINT " score is give
n for any""guesses which may be right""colours b
ut which are in the""wrong position."
100 PAUSE 5:sec
110 PRINT AT 10,0;"COMPUTER:"
120 PRINT AT 12,0;"GUESS  "
130 PRINT AT 14,0;"SCORE  "
140 DIM a(5); FOR i=1 TO 5: READ a(i): PRINT AT 1
0,10+2*i; PAPER a(i); INK 9; BRIGHT 1;a(i); NEXT i
: DATA 1,2,3,4,5,4,7,7
150 FOR i=1 TO 5: READ a(i): PRINT AT 12,10+2*i;
PAPER a(i); INK 9; BRIGHT 1;a(i); NEXT i: DATA 6,2
,1,7,5,4,4,3
160 RESTORE
170 PRINT AT 14,12;"*****"
180 PAUSE 10:sec: PRINT "Note the score only sho
ws how""many pegs are right; it does""not show w
hich are right."
190 INPUT "Press ENTER to continue: "; LINE a#
200 CLS
210 REM setting up
210 INPUT "How many PEGS (2-8): "; p
220 IF p<2 OR p>8 THEN GO TO 210
230 INPUT "How many COLOURS (2-7): "; c
240 IF c<2 OR c>7 THEN GO TO 230
250 INPUT "How many GUESSES (2-9): "; guesses
260 IF guesses<2 OR guesses>9 THEN GO TO 250
262 CLS : PRINT AT 10,0;"Chance of guessing solut
ion in ""[guesses]" attempts: ""[INT (1/p^c)/guess
es];""1 against"
263 INPUT "Press ENTER to continue."; LINE a#
270 LET k=0: LET ki=0
280 DIM at(p): DIM b(p): DIM c(p)
290 FOR i=1 TO p: LET a(i)=INT (1+c*RAND): NEXT i
300 REM the game
310 CLS : PRINT AT 0,12; PAPER 2; INK 9;"DEDUCTIO
N"
311 PRINT AT 2,25;"score"
312 FOR i=1 TO p
313 FOR j=1 TO guesses
314 PRINT AT 2+j,32-i;"D"
315 PRINT AT 2+j,1+2+i;"0"
316 NEXT j: NEXT i
320 FOR q=1 TO guesses
330 PRINT AT 2+q,0;q
340 FOR i=1 TO p
350 PRINT AT 21,0;"Guess peg "(i); "(1-";(c);") "
:
360 GO SUB 2000
370 LET b(i)=d: PRINT AT 2+q,1+2+i; PAPER b(i); I
NK 9; BRIGHT 1;d
380 NEXT i
390 REM check the guess
410 LET k=k+1: LET bk=0: FOR i=1 TO p:
LET c(i)=a(i): NEXT i
420 FOR i=1 TO p
430 IF b(i)=c(i) THEN LET bk=bk+1: LET c(i)=-1:
LET b(i)=-2
440 NEXT i

```


PROGRAM

```

650 REM find the whites
660 FOR i=1 TO p
670 IF b(i)=2 THEN GO TO 730
680 FOR j=1 TO p
690 IF b(i)=c(j) THEN LET wt=wt+1: LET c(j)=-1:
LET j=p
700 NEXT j
710 NEXT i
800 REM do the scores
810 IF bk<>p THEN GO TO 1000
820 REM SOLVED IT
830 PRINT AT 2*g,22: FLASH 1: INK 2:"WELL DONE!":
PRINT AT 21,8:
840 FOR i=1 TO 6: BEEP .1,1: NEXT i
850 INPUT "Press ENTER to continue. ": LINE wt
860 LET g=guesse: GO TO 1200
1000 REM show score
1010 IF bk=0 THEN GO TO 1100
1020 FOR i=1 TO bk
1030 PRINT AT 2*g,31-bk-wt+i:"x"
1040 NEXT i
1100 IF wt=0 THEN GO TO 1200
1110 FOR i=1 TO wt
1120 PRIN AT 2*g,31-wt+i:"x "
1130 NEXT i
1200 NEXT g
1210 IF bk<>p THEN GO TO 1500
1220 REM restart
1230 CLS
1240 PRINT AT 8,10: PAPER 5: INK 2:"DEDUCTION"
1250 PRINT AT 5,3:"1=RESTART"
1260 PRINT AT 6,3:"2=CHANGE PEEK etc."
1270 PRINT AT 7,3:"0=END OF GAME"
1280 PRINT AT 8,3:"N=NEW PLAYER"
1290 IF INKEY$="" THEN GO TO 1290
1300 IF INKEY$="1" THEN GO TO 1300
1310 IF INKEY$="2" THEN GO TO 300
1320 IF INKEY$="0" THEN GO TO 300
1330 IF INKEY$="N" THEN STOP
1340 IF INKEY$="n" THEN GO TO 370
1350 GO TO 1290
1500 REM failed to solve
1510 PRINT AT 21,8:
1520 FOR i=1 TO p
1530 PRINT AT 21,1+2*i: BRIGHT 1: PAPER w(i): INK
?w(i):
1540 NEXT i
1550 PRINT AT 21,28: FLASH 1: INK 1:"<<< SOLUTION"
1560 FOR i=1 TO 10: BEEP .1,-i: NEXT i
1570 INPUT "Press ENTER to try again ": LINE wt
1580 GO TO 1220
1999 STOP
2000 REM colour input
2010 IF INKEY$="" THEN GO TO 2010
2020 IF INKEY$="1" THEN GO TO 2020
2030 IF INKEY$="2" OR CODE INKEY$>40 THEN GO TO
2010
2040 LET d=VAL INKEY$: BEEP .1,0
2050 PAUSE 10: RETURN

```

Deduction

This educational program is intended for four to seven-year-olds. John Wright gives you comprehensive details of what it does and how it works.

The program was written by my son, Matt, who was a high-achieving high school senior. He was a member of the National Honor Society and had been awarded a scholarship to attend college. He was a very bright and motivated young man, and his work on the program was a testament to his talent and hard work.

[illegible][illegible][illegible]

1000

118-740 **Alphatec Systems Corp.**
978-680 direct ext'd 200
fax 978-680-2000

1000

[illegible]

100

1976-1980	display screen.
1976-1980	display case window.
Units of L&L to be added:	
1976-1980	photo - for copies.

Applicants for CHARR receive
B-T (long) postal packets
28 and 29 showing layout and
CHH Mark.

Personal
 Mrs. Ernest (2000-4000) can possibly be
 later spelled Ernest (2000-4000) with
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 character's strong with alternative
 for taking time
 Mrs. Ernest (2000-4000) can be later
 spelled Ernest (2000-4000) with
 a new name

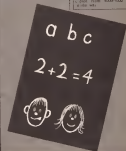
Baking away
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 for (other) (other) and
 also for (other) for (other)
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4000-4070 simple, more
4080-4120 get into new month
 and enjoy them
4130-4180 month not with a
 quieted member
4190-4240 plan for right
 money, plenty of cash
 money needed
4250-4300 money and other
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4310-4370 money less money
 more money
 and, just for real don't
 forget
4380-4430 money and you can

Allegory
 1990-1991 essay in which the author discusses the allegorical nature of the various illustrations in the book, and how they relate to the author's own life.

[illegible]

Please see caption
 4.15 (cont'd)
 FILE name is PRINT AT
 PR. PAPER is optional full
 printed colors
 MLINK path is optional
 user's home directory
 followed by .WAF
 %dfl goes to Pdl/00
 FILE 0.1 and first code
 00000000

[illegible]

ORIC/ATMOS PROGRAM

[illegible][illegible]

THOUGHTS & CROSSES

37 MARKET STREET, HECKMONDWIKE, WEST YORKS

COMPUTING
 WITH A NEW STANDARD: AN OLD NEW WAY
 OF THINKING
 ABOUT IT
 WITH A NEW STANDARD: AN OLD NEW WAY
 OF THINKING
 ABOUT IT

[illegible]

RESEARCHER'S NOTE

Researcher's Note: The following information is for informational purposes only and is not intended to be used for clinical or research purposes. The information is provided for informational purposes only and is not intended to be used for clinical or research purposes. The information is provided for informational purposes only and is not intended to be used for clinical or research purposes.

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Keywords: *gender inequality; gender discrimination; women's empowerment; social norms*

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SHIPPING CHARGES WILL APPLY

Shingo Suglura studies six of the best and comes up with his assessment. Read on to find out how they compare

On the face, you are positively encouraged to write programs in machine code simply because of the very non-intuitive and powerful assembler which can easily be linked with BASIC.

However powerful the assembler may be, debugging machine code is never easy. If you've made a mistake, you are most likely to be faced by an insupportable crash. This is not the assembler's fault and the only way to debug machine code programs is to use machine code monitors.

There is a daunting number of machine code monitors for the BBC micro available and since they're not easily reviewed, it's difficult to make a choice. So in this article, I have looked at six of the best selling BBC/Micro-based machine code monitors available for the BBC (and the Electron in the case of Spectrum).

In comparing the various monitors, I have concentrated on the following points:

Screen layout: The screen layout of a machine code monitor should be clear with as much of the necessary information as possible on the screen at once. The use of colour is often helpful but expensive and could well be distracting.

Expensive evaluation: A good experienced programmer is very useful. You may think that as long as hexadecimal is understood, it's OK, but it's often useful to see decimal or other expressions such as 375+410.

Disassembler: The disassembler is the more frequently used facility of any machine code monitor. It is vital that the disassembler is fast so that you can wade through to a desired memory location. Extra facilities such as labelled references and vectors, offsets and the ability to follow subroutines are useful (although quite unnecessary, some of these facilities were implemented by the monitors reviewed).

Memory dump/editor: Programming in assembly language doesn't mean you

don't have to look at hex dumps. Memory dumps are often useful to examine data. For example, the ability to edit memory in a single monitor is very important. For example, you don't want to go back to BASIC just to alter one byte of memory using the calculator interface. Full screen memory editors which allow you to scroll through memory and edit any byte in hex (usually a nibble at a time) or ASCII is a real boon. It's also very useful to be able to edit in assembler instructions for obvious reasons.

Search: It is often necessary to find a range of bytes or characters. The search should be as fast as possible and it should be able to search for more than one byte at a time.

Single step/monitor: The ability to go through machine code one instruction at a time is called single stepping. This is an extremely useful feature for debugging machine code.

Breakpoints: Although single stepping is very useful, it is a real pain going through a monitor in a section of code which you know to be working correctly. Sometimes, all you need to know is the contents of the registers at a certain point in the program. This can be done by setting break points.

Subroutine calls: A machine code editor may seem to be

working, but in reality, it isn't. Now you can single step through the routine using the above feature, but it takes time. It's enough to examine the contents of the registers or certain memory locations in this type of session. The fastest is quick and often effective.

Memory shift/Reference: The ability to shift a block of memory to another address is almost always included in machine code monitors even though they are seldom used. The same goes for code relocation. This feature is rather hazardous since 100% code relocation is almost always impossible.

Compare memory blocks: Another feature which is hardly used, but almost always implemented is the facility to compare two blocks of memory.

Assembler: You may be wondering why I've mentioned an assembler in a machine code monitor article, when there's a very good one built in BASIC. The reason is for starting small parts of a machine code program without actually having to return to BASIC. Another reason is that there are several problems with using the BASIC assembler. For example, the assembler directive wasn't very powerful and for writing very large machine code programs, it is

rather cumbersome. However, to overcome this problem, you need a full two pass assembler and, usually, assemblers included in monitors are single pass types which can be used for the former reason.

Manual: Last but not least, the manual. A good manual is essential because let's face it, machine code monitors are quite complicated beasts. A manual should be clear but comprehensive. It is also helpful to have technical information about the machine code monitor itself. For example, the amount of memory it can handle and the use of technical jargon doesn't make reading easy.

The machine code monitors I looked at are Emu-aid by Emu-aid, Emu-aid by Northgate, Gemini by Computer Concepts, Monitor by Watford Electronics, Spectrum by Sargent Software and ADE by Systems. The addresses of the suppliers are given at the end of this article.

Screen layout

When Emu-aid is started, MODEP is selected and you, of two page a screen together with the registers. As the commands are entered and executed, the screen scrolls. Every time the BASIC key or F1/PAK is pressed, the memory dump screen is updated. Emu-aid has a similar screen

EXMON by REESUG											
A	X	Y	S	P	flags	PC	stack				
00	00	00	FF	30	8	0000					
0000	:	24	19	24	19	00	7C	00	7C	\$.	\$..H.H
0008	:	00	30	01	08	00	00	FF	62	0.	0...e
0010	:	FF	7F	00	02	05	00	00	00	.	.
0018	:	19	00	07	00	00	19	00	00	.	.
0020	:	00	24	02	FF	C3	07	00	40	0.	0...0
0028	:	FF	00	07	00	00	00	00	00	.	.
0030	:	03	00	00	00	00	C3	07	00	.	.
0038	:	07	EE	20	00	FF	01	19	00	.	.
0040	:	03	00	00	00	86	81	06	00	.	.
0048	:	00	00	00	00	00	00	00	19	.	.
0050	:	10	00	10	00	10	00	FF	FF	.	.
0058	:	FF	FF	FF	FF	FF	FF	FF	FF	.	.
0060	:	00	06	FC	15	06	00	00	00	.	.
0068	:	00	00	1C	00	00	00	00	C4	.	.
0070	:	41	3C	66	66	7E	66	66	66	A	44-444
0078	:	00	00	C0	03	00	00	00	00	.	.
Type	?	for command list									

Exmon — screen dump

layout through the commands are confined to the bottom five lines of the screen. Also, colour is used to good effect (in Exmon-1, the only splash of colour is found in the title).

When Exmon-1 is started, a hex dump is shown in a similar fashion to Exmon, but the commands are entered and executed in the lower half of the screen. This means that the hex dump is left unattended. A major feature of Exmon-1 is that it can work in any mode although screen updates is unfortunately slow in modes other than MODE7.

When Exmon-2 is started, MODE7 is selected and a little command strip appears at the top of the screen. The commands are always entered in the same place but any output is directed to the rest of the screen. This is probably the more user friendly and neat screen layout and should not begetters to machine code.

When Exmon-3 is started, MODE7 is selected (don't forget, this monitor was originally written specifically for the Spectrum which does not have MODE7) and 15 lines are displayed together with the commands and breakpoints. Commands are entered in a command strip at the bottom of the screen. One nice feature is that you can repeat or even edit the last command you typed in. For some reason, Megas decided to use a rather plain style.

On entering ADE, MODE7 is selected, and a section of memory in page 4FE is pointed together with the registers at the top. A couple of lines at the

bottom of the screen is used as a command entry window. One nice feature of ADE is its extremely fast screen updates and colour is used to good effect.

Expression evaluator

Exmon-1 and Exmon-2 use the BBC BASIC's very powerful expression evaluator. Obviously, this means that anything that BASIC understands, Exmon understands (although Exmon-1 doesn't support variables). However,

expressions can't be included in commands in the form 'DDB A100+123'. You can only calculate.

Exmon-3 leaves the more powerful expression evaluator of the lot. It is based on the language C so programmers based on BASIC will find a rather confusing at first. Expressions may also be incorporated into commands in the form 'CALL A100+123'.

Exmon-3, Exmon-2 and ADE graphically accept hexadecimal data.

Disassembler

Disassemblers of Exmon,

Exmon-2 and ADE are all pretty standard. One thing to note is the speed of ADE's disassembler. It's incredibly fast the disassemblers of the two Exmon-3 may be used to disassemble in file so the object code may be disassembled at a different address by the host disassembler.

Exmon-3's disassembler can be used to disassemble in a format which can be read back and assembled at a different address by a host disassembler (see monitor).

Exmon-3's disassembler is slightly more sophisticated than the others in that it allows you to scroll forward and backwards through memory and it also allows you to step over the disassembled code using standard monomorphs to start it. In this way, it's very easy to alter small parts of machine code.

Disassemblers in general were rather disappointing. It would have been good if the operating system, Exmon-2 and the various were all labelled.

Memory dumper/editor

Exmon-3 has a useful memory dump facility but only supports a very crude hex/ASCII editor. Exmon-2 supports a full hexadecimal memory editor (hex/ASCII). However, the scrolling is painfully slow and the cursor tended to disappear when it was being moved in any given step.

Exmon-3's memory dump is good, especially in 40 column mode where it looks are

EXMON by Reesugsoft											
A	X	Y	S	P	flags	PC	stack				
00	00	00	FF	30	8	8000					
8000	C9	01			I.		CHP	8801			
8002	F4	1F			P.		SE0	88023			
8004	60				E		RTS				
8005	EH				E		NOB				
8006	60				E		RTS				
8007	0E	01	42		S		R01	84201			
8008	41	53			AS		LOR	8530,X)			
800C	49	43			IC		LOR	8843			
800E	00						PRE				
800F	28						FLP				
8010	43						35				
8011	29	31					R01	8831			
8013	39	38	32			982	R01	88238,Y			
8016	20	41	63			80	JCR	86341			

TD
TH 7C00+8000,1900

Exmon-3 — screen dump

shown on one line. Although it doesn't have a full screen memory editor, it has a very powerful editing command "I". This allows you to alter the first bytes by the memory dump editor by entering a hex value (or 16-bit value) or a string of characters or even several instructions.

Breakpoints is the only machine code monitor reviewed here which supports a full screen scrolling memory editor. In my opinion, that is the natural editor to use.

Screenage does support a full screen editor but it only allows you to add one word full of memory at a time. Memory may be edited on hex or ASCII.

With ADE, you simply type a hex byte and it is written to the address pointed to by the memory pointer. The memory pointer is automatically incremented. In process that screen works well and can be quick and effective once you get used to it.

Search

All of the monitors allow you to search for a number of bytes (up to a number of ASCII characters). The search is quick.

Single step

In single stepping mode on Emu-1 there are three options. By pressing the space bar, the current instruction is executed and the contents of the registers are updated. By pressing "V" you can single step through programs as shown

above when a JBR instruction is encountered, when the subprogram is loaded to the top.

By pressing "I" you can simulate a series of instructions on a subprogram, conveniently displaying the instructions and the registers. Equivalents to pressing the space bar is shown. On Emu-11, all these features are available as top of a unique feature called dual screen. Quarterly, the facility allows you to flip back and forth between your graphics screen and Emu-11's main screen as well. I must confess that this is the best debugging aid for graphics programs I have ever used.

In Gremlin, you can single step through code by pressing "V". You can set limits to the memory area to be single stepped, so that if you set the upper limit to 4000, JBRs to

the operating system will be treated as a single step. This is useful in the debugging "V" option but not as useful.

In Breakpoint, you can set limits to you can set Gremlin, but there is also a subprogram to single step a range as in Emu-11. However, you can single step through code by pressing CTRL-Z. There is an option to set subprograms at one step or an option to single step specified number of steps. You can, however, treat all operating system calls as single step (subprogram is ACORN-AL-11).

Single stepping on ADE is the weakest of the lot. From start, it doesn't allow you to set limits, treat subprograms as a single step nor does it allow you to single step a specified number of steps. Also, worse of all, a get confused if you alter the code you're stepping through with

any operating system subprogram (although this problem can be overcome by using Breakpoint).

One impressive feature in the screen editor. The disassembled code is constantly updated as in the others, but in ADE the current instruction is in use and updates on ADE is incredibly fast.

Breakpoints

Perhaps because of Emu-1's age it was one of the earliest machine code monitors on the market, it features one of the weakest breakpoint handlers. It allows you to set up to five breakpoints. When Emu-1 "hits" a breakpoint, the contents of the registers will be displayed and control will return to the monitor.

On Emu-11, up to 10 breakpoints are allowed at once and they may have conditions attached to them. For example, you may set a breakpoint so that it is only effective if the accumulator contains 100. Quite surprisingly, this exceedingly useful facility is only found on Breakpoint and Starman.

In Gremlin, you can have up to eight breakpoints. As in Emu-11, you can't set them as ROM and they can't have any conditions, so in Emu-11, Breakpoint and Starman. When a breakpoint is encountered, a warning beep will sound and the registers are updated. The user may then examine instruction in the next breakpoint or return control to the monitor.

Breakpoint's breakpoint handling facility is very powerful but also fairly complicated to use. Breakpoints can be set anywhere, even at ROMs, but more importantly, you can set conditions to the breakpoints. For example, you can set a breakpoint at 4000 but cause a break only when the

A=65				X=10				Y=00							
S=01FF	89	10	83	E3	88	93	93	93	84	00	06	...	...	...	...
PC=H400	20	88	88	83	83	20	33	84	00	06	...	...	...	...	...
	JBR	8388													
	20	20	20	20	20	20	20	20	20	20	20				
7FF0	20	20	20	20	20	20	20	20	20	20	20				
7FF0	20	20	20	20	20	20	20	20	20	20	20				
H=8000	4C	06	80	80	4C	06	80	80	4C	06	80				
8000	10	06	80	80	10	06	80	80	10	06	80				
8010	43	06	80	80	43	06	80	80	43	06	80				
8018	43	29	31	31	43	29	31	31	43	29	31				

GREMLIN

!H8000
!SRM=1
!SRM=65
!X=10

Gremlin — screen dump

BEERNON

BEERNON

Electronics

Modification mode

Command : HM

Start : 2C00 End : 8000 To : 1900

Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8000	09	01	F0	1F	69	49	60	0E	...	...	...	...	...	...	...	...
8008	C9	42	41	53	49	43	00	28	...	...	...	...	...	...	...	...
8010	43	29	31	39	38	32	20	41	...	...	...	...	...	...	...	...
8018	63	6F	72	6E	0A	00	00	00	...	...	...	...	...	...	...	...
8020	80	00	00	00	00	00	00	00	...	...	...	...	...	...	...	...
8028	86	06	84	07	09	83	20	F4	...	...	...	...	...	...	...	...
8030	FF	84	80	82	00	86	1F	8E	...	...	...	...	...	...	...	...
8038	02	04	8E	03	04	CA	86	23	...	...	...	...	...	...	...	...
8040	82	08	8E	06	04	CA	86	01	...	...	...	...	...	...	...	...
8048	04	09	01	23	11	05	00	03	...	...	...	...	...	...	...	...
8050	0E	05	0F	05	10	00	0C	89	...	...	...	...	...	...	...	...
8058	41	85	00	89	52	85	0E	89	...	...	...	...	...	...	...	...
8060	57	85	0F	89	02	80	02	02	...	...	...	...	...	...	...	...
8068	89	84	80	03	02	58	41	00	...	...	...	...	...	...	...	...
8070	86	41	4E	44	80	50	41	42	...	...	...	...	...	...	...	...
8078	53	94	00	41	43	53	95	00	...	...	...	...	...	...	...	...

Beeron — screen dump

STAFFORD MONITOR 401.5
2nd Floor, Building 100

```

$44 QCT  EVENTS  -0 00
              -7 00
              -6 00
              -5 00
              -4 00
TRACES      ROM = 00
              -7 00
              -6 00
              -5 00
              -4 00
              -3 00
              -2 00
              -1 00
              0000 00
              01 00
              02 00
              03 00
PC = 0000      PA = 00
SP = 0000      ST = 00
REG = 00000000  RM = 00
              01 0000
              02 00
              03 00

```

Table 1

accumulator contains 419, say. The problem is, seeing three consecutive divisions working at the level, which isn't easy, so we the host. You can have right handovers at once.

Microsoft's recently allowed you to do the same as Berkeley's and Xerox's: setting pointers to very simple static buffers. For example, to allow Berkeley to store only where location 70 contains 20, you simply type `E 70 = 20` (where `E` is the location). However, one thing is that you can only set one location at a time.

With AIDS: you have to permanently insert a **MARK** attachment in the code by using the memory phone. This does mean that you can have an amnesia breakfast as you like, but it does also mean that you have to remember the original instructions if you want to restore your code after testing it. When a breakfast is lost, the registers are displayed or you can choose to restore **MARK** to original.

subroutine calls

[illegible]

Learn more about your computer code by typing G. The registers may be an early effort at a human, there is a family to create. GBTTS and GBTTS.

Sign allows you to connect
made by typing J. The network
components are distributed all over.

Memory shift/relocation

All the machine-code extensions have a unique and no common. All of them cope with overlapping data.

With *Assembly* and *ADB*, replacing code is done by disassembling the code and reassembling it at the new address using the built-in assembler.

Según las cámaras, con sólo dos días, los autos han sido retirados y almacenados.

Nonlinearities have been identified in a number of studies, including the following:

Education does not have a
relatively constant

Memory

Agave from Coahuila, all the specimens have a single or compound two-bladed leaves.

Discussion

Hammer-II has a rather crude but perfectly usable assembler. It is a single pass type so you can't jump forward to a label. However, it is very useful for changing a small piece of code. Although the assembler on **Hammer-II** is crude, it is a vast improvement over the assembler on **Hammer-I**. The manual

content is updated every time an insertion is assembled and although it's not a full two-page report, it is possible to use forward labels.

One of *Armadillo's* strongest features is its full two-pass assembler. Coupled with a very powerful expression evaluator, it even does the built-in BASIC assembler. In fact, once the assembler has assembled source code, it strips from that the memory code to be created using a standard file translator. The manual suggests the use of Woodward for this purpose, there is no restriction on the use of the source code as a BASIC assembler.

Backman: supports a simple assembler but it can't handle labels or forward references, but it is useful for debugging small constructs. The instructions are typed over the disassembled code which can be scrolled forward or backwards through

Business does not respond
more to a "businessday"

ADIR: "Shouldn't we have provided some form of assembly language package rather than a machine code generator? It makes sense to emphasize the very powerful assembler. It is a full two pass assembler which supports various address operators and macros. In fact, ADIR even has a built in test mode to check your assembly code. This editor is so powerful that it can be used as a wordprocessor as well. Besides, so far, the assembly is the most powerful of all the assemblers reviewed here and was professional when the book is complete!"

[illegible]

0000 C9 E0 CMP HSLF0

11300

Abstract

BBC/ELECTRON MONITORS

100

Emacs-9 comes with a 36-page 4.5 MB manual. Because of its small size, some of the comments aren't as complete as they should be, but nonetheless, the explanations are clear and anyone has been left in the lurch. Even though it is a manual, it would have been nice if Borby included an index and more technical information. The manual of Emacs-9 is surely laid out, but even

Granite comes with a TI-poor A5 two manual, 1/2" incredibly over-engineered and so it results, some parts are quite hard going. It would have helped if Caspary's Computer spread out the test a little more and included an index.

Reception comes with a 16-page A3 hard manual. The print is appreciably larger than the rest and the entry speed-out. Although the explanations are short, they are easy to understand. Again, there is no video.

Since ADE is a very sophisticated package, as expected, its manual is large. It is a 481 page and contains of around 200 pages. There is

comprehension index and the whole material is very easily presented. Each component is comprehensively described and there's plenty of practical information as well. In fact, I would even go as far as to say that there is nothing wrong with this method.

1999

Wasson-1 is the oldest of the reservoirs situated on the west side. As a result some of the facilities are gradually antiquated, especially the primary editor and headlight. However, Wasson-1 remains the breadwinner of the original and Wasson-2 is now a few months younger. It is one of the best maintained. It's the most modern, has the most equipment and is, in fact, more expensive. The dual access facility is substantially the distinguishing and the facilities are very powerful too. Also, it is very reasonably priced, especially for flooding equipment. It should be on the top of your list of reservoirs.

Crescible is one of the most powerful resolutions available, but also one of the more complicated to use. Beginners' 22 machine code may find that it is too difficult to use and the

Overall, my job seems a little daunting. However, to expand my machine code, it could be the way to live.

Bestman is probably the most user friendly monitor of all. It is the only monitor with a deep, full screen memory editor and scrolling disassembler and its emulator facility is unmatched by any other.

Hardware is very easy to find, and that's a very nice Breakpoint facility. It seems to me manufacturers that it may be slightly designed for the Macintosh (with ROM-based) and to a lesser extent, the Macintosh Plus. The most useful feature is the ability to use a "mouse" to move the cursor around the screen. This does not seem to be a very useful feature, but it is a nice touch. The screen updates are noticeably slower than those of the Macintosh Plus. I have had several, because of the slow screen updates, it can be recommended to Macintosh Plus. The screen updates are noticeably slower than those of the Macintosh Plus. I have had several, because of the slow screen updates, it can be recommended to Macintosh Plus.

ADSL is rather different from all the others in that it is a **mainline code development tool** rather than just a **testcase code generator**. In fact, it resembles

is perfectly usable. While it lacks the manual, I would say it's the obvious choice for any serious assembly language programmer. However, the machine code monitor is rather weak when compared with others available and should possibly be complemented by another monitor.

Flanagan, J., Flanagan, H., Holmquist, J.
 1993. *How to do it: A guide to qualitative research*.
 New York: McGraw-Hill.

Granite, Computer Concepts,
Oxfordton Place, Haverhill,
Massachusetts 01830

Business: Winford Electronics
Dept. 884C, Christl Rd., Win-
ford, Maine

Stearns, Roger Software,
115 Stearns Rd., Chatham,
Mass.

Adm. System, Dept. B, 15
College Ave., Sheffield
Mass.

[illegible]

Hunchback II CBM 64 £7.95

Oscon, 8 Canal St, Manchester

After a's success with Hunchback, it's hardly surprising that Oscon has brought out a sequel. It seems Osconquely doesn't love Hunchbacks from part I and must attempt to rescue her again.

This time for good make a five stage ball game, each screen containing one stage.

In effect, this is a graphical adventure. On each screen you collect the small balls. While moving about you must avoid bats, skeletons, bouncing skeletons and other perils. You are aided by climbing ropes and jumping about on platforms.

Graphically this game is very

solid. I was particularly impressed with the way Osconquely takes control of the exciting game rather than falls to them. The other obvious feature is that it's enough for me. I haven't got past screen two! The design of the graphics is a high standard and the animation is smooth and well thought out.

But when I thought it had enough of graphical adventures, something like that comes along and restores my interest. In short, yes, I consider this to be better than part one. It's certainly very original.

A 70

instructions	100%
size of art	100%
graphics	100%
value for money	100%

★ ★ ★ ★

Battle Through Time CBM 64 £7.95

Average, Unit 10, Victoria Rd, Stanford, Kent

This is a classic shoot-'em-up game, the kind that has you dodging straight for the action which on your joystick, if it has one. You have control of an all-terrain plane (rocket) vehicle — in other words, a small car which can jump over obstacles. You can shoot forwards and upwards to destroy an assortment of planes, satellites, missiles, dragons and robots.

There are seven areas, each representing a different war, and you have to avoid an order of eight before being transported to the next.

Though the concept is simple, the game is quite difficult to play. It's easy to fall into a shell-hole while trying to evade the bombs being dropped on you. If you speed up to avoid a falling plane you may find as soon as you a bombster before you crash into it.

Fortunately, you can start each game from the point where the last one ended, so you need a frequent chance of seeing all the areas.

The graphics and sound are well up to standard and it should keep you tapping happily for several hours.

A 70

instructions	100%
size of art	100%
graphics	100%
value for money	100%

★ ★ ★ ★

Blue Max CBM 64 £9.95

CDI Gold, Unit 10, The Parkway Industrial Estate, Birmingham B7 4LY

You are at the controls of a World War I plane. Along over enemy territory, and your task is to shoot, avoid a bomb enemy targets. You have only a limited supply of fuel and bombs, but fortunately there are friendly aircraft to drop bombs, which when you can land for refuelling and repairs. Sounds easy, doesn't it?

It isn't the most difficult flight game I've seen, but it does have far better graphics than any of the others. You have a view of your plane and its shadow, and the landscape which scrolls diagonally to give realism.

You start the game with only one life, so said you have got the thing of it, the game can be over almost before it's started, but fortunately it shouldn't take you too long to learn how to make it off and drop bombs safely. Striving is more difficult, as it can take the expert a while to remove all the wings.

It's an attractive and interesting game, but not one that I would need to keep playing for hours.

instructions	100%
size of art	100%
graphics	100%
value for money	100%

★ ★ ★ ★

Now follow that!

All these titles have a familiar sound. Find out if our reviewers think they come up to scratch

Mr Wiz CBM 64 £7.95

Superior Software, Bognor Regis, Sussex, Sussex, Sussex

You must guide Mr Wiz across a garden collecting, or eating, cherries as you go. Small blue insects called grubs try to corner him. Guarded about the garden are apples, which can be transformed so that they fall on the grubs. You gain more points by eating the cherries than by eating the grubs. You lose the game when you eat the cherries. Clear the screen and it's on to the next. We sure you will have noticed that this is a very version of a well known arcade

game, and in such it's a fair copy.

Design is slick with colourful graphics and smooth animation. The background music is a nice change from the old over-the-top Orpheus in the underworld, and becomes rather tedious.

The game is perhaps a little too fast, with rather slow snakes. I find the time after players might find it too slow. I found it boring after a while, but I'm sure and maybe fast will save it. The main weakness is it's lack of originality and variety.

A 70

instructions	100%
size of art	100%
graphics	100%
value for money	100%

★ ★ ★ ★

Kong Strikes Back CBM 64 £7.95

Oscon, 8 Canal St, Manchester

I'm rather surprised at the best of seven and it was well not surprising that I found this game. It conditions you to take, trying to follow again well known, simple game for a while for a change. As it turns out, my first view is unfavourable. This game is really supposed to be a Kong game.

The action takes place on a roller coaster. The King is held by Kong to the top of the track and you must climb up and across him. The main feature is you can which Kong walks down the track to you. You can either climb up behind to avoid them or knock them. If you knock a rat, Kong will send another down.

Since you only have four lives, they should only be used in emergencies. There are other obstacles such as bouncing balls, whistles and ladders. Collecting items will get a single item, which is a life. You can collect points by climbing on the various ladders at each of the four screens.

Keep the momentum of all obstacles is cyclic. This is a game of timing and timing. The use of computers in colourful and games and the background music is most enjoyable.

Overall a tough and highly entertaining game.

A 70

instructions	100%
size of art	100%
graphics	100%
value for money	100%

★ ★ ★ ★

CONMOORE LA PROGRAM

[illegible]

Dave Carlos has been looking at AMX Mouse — and he's impressed with what he sees. Read on to find out why

AMX MOUSE \$32K BBC £89.95

Advanced Memory Systems,
Woodside Technology Centre,
Warrington WA4 3JG

Designers are always searching for alternative methods of getting a computer what you want it to do. The latest of these is the AMX mouse, a device that is a great deal of difficulty required in learning to use the computer's keyboard. Some years ago designers working for Xerox came up with the idea of using a little device that could be used by pointing it around a desk top. This could then be used to tell the computer what you wanted to do by having a central or 'home' button on the device. This device became known as the 'mouse'.

The idea was used for a short time and then the designers at Apple took it up and came up with the most revolutionary computer we have seen in the last few years, the Lisa. It was revolutionary because it could be used by anyone within a matter of minutes. It used a mouse for a great deal of its input and all you had to do was point the pointer, by moving the device around the

desk top, until a pointer at the picture of what you wanted to do was over.

Then by pressing the button on the device's back you had the chance to choose again from a list of possibilities. The picture on screen is moved but a desk took less of paper and these happened little by little.

The idea has since been used by a number of other manufacturers as designers search for this in the few mouse designed for the BBC computer and probably the first for any of the home machines. This mouse is a small black box with three red buttons on the front. It is connected to the BBC by a flexible cable and is attached to the User Port. On the outside of the box there are two controls which are really shaped like handles. The box is designed to be used as a joystick and just for portability, it is the case of most ball bearings which is the end mounting part.

Before you can use the mouse there is a 'mouse support' disc to be inserted in the BBC main board. This provides the user with all the commands required

to make the mouse perform its



AMX art graphics program

to make the mouse perform its duties. Included in the box — one of the best designed packages that I have seen in this format — are the two manuals and a disk containing of driver software for the little beast. Also, with the software is installed do you get an idea of the rest range of

possibilities the mouse can offer.

The main part of the software is a drawing program called AMX Art. This lets a user work all the various tools and should you can use find out in front of you. There are a whole range of drawing modes. You can use an attribute exchange, text, lines, fill, patterns and more such as.

There are very few words on the screen, however, as you select each option by moving the mouse's pointer to the window you want and pressing the mouse button to confirm your choice. It is completely self-explanatory in a few words that this is the very best of drawing programs for young children. When I was only six or seven old we used drawing tape and I had to go away to get the tape from the room.

The pointer, used instead of words, are very important in the world of computers and there is a whole program provided which shows you to design your own 'mouse' as they are known. This too is a very good program rather like a driver that you design program but with a mouse program in mind. There are two sets of icons provided for you to use but you can create as many more as you wish.

If there are only complementary things to say about the product, it is well designed and contains an almost every request it really does make the work of education very simple and designed. The mouse will also be used with commercial programs which are already available, with it will



AMX Mouse in use

PERIPHERALS REVIEW

processors and peripherals but the manual is rather slacker than how that is best arranged.

If there is a criticism to be made is if there is only basic dedicated software yet available.

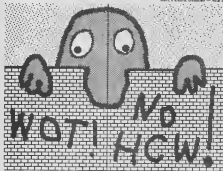
As for future: The co's really has thought in this case. The manufacturers will see that there are programs being developed which will give the system to full a range of possibilities as are

present in the Lisa and Macintosh systems.

A word of the latest package from Acorn popped in as I was playing and he commented that he very much preferred the so-

lar Wind although the one is above one quarter of the CPU for the Macintosh system. This is quite modest. Get out your traps and go working. You won't regret it.

Don's article continues — with the help of the Apple Mouse



Home Computing Weekly

45p
every
Tuesday

That's your highest possible score in Richard Kembley's superb darts program. He tells you how it works in great detail, too

How it works

This is an easy program to understand as it relies heavily on variables, and their values between them almost all the time. It's split up into many different subroutines but starts mostly from the display routine at line 1000, which calls up the player names, which is then called up any other routines needed depending on the response.

The password routine can easily be changed — you have just lines 7700-7800. The password stores the codes for each letter in a string 999. When needed for checking, these numbers are re-connected to characters and stored in another string, 000, for comparison with the user's input.

As soon as the comparison is made 000 is blanked so that the password is destroyed for as short a time as possible.

The graphic display of the word "DARTS" can also easily be changed.

How to use it

After you have entered the password, you will be asked for a starting score which must be 501, i.e. 101 200 300 400 up to 500. Then, you must enter the two player names.

After that you will see the main score display which contains all the information about the state of the game. Below the two names are the current scores of the two players. Below the LANE shows the last score entered. This is to prevent cheating by entering the wrong score.

DIFFERENCE is the difference between the scores followed by the first initial of the leader in reverse video. This is how many manufacturers have been championed. **HIGHEST SCORE** is the highest score since the program was first loaded, which is followed by the name of the high scorer. **HIGHEST CHECKOUT** is the highest checkout since the

program was loaded. **POWER DARTS** is the lowest score used to finish a single game, followed by the winning score in that game.

A blank area is used for messages, and below this are the input requests.

When you have checked our issue "D" for feedback and the program will ask how many darts you used to complete the 501 point last throw. If you had three enter "3" instead of a score. At game over, if you decide not to have another game the program will PAUSE.

Hints on conversion

Conversion should be easy with very little change. As long as you have a reasonable grasp of BASIC, you should be able to convert an early game of the program which your computer won't handle. The command **PAUSE** on the ZX81 merely doubles the score's processing speed, with the disadvantage that the screen display is lost.

Any lines which are not commented can be entered as your computer will be as fast or faster than the ZX81 in the most ways.

You could always jazz up the program, by adding music for example when the computer is waiting for input.

Here is a table
 10-99 overall memory
 68-149 graphic display of most data
 150-760 score information
 760-1000 names
 1000-1100 scoreboard display
 1100-1150 names
 1150-1170 player 1 inputs and password
 1170-2000 player 2 inputs and password
 2000-3000 player 1 and 2 scoring inputs
 3000-3050 score and name checking routines
 4000-4100 variables
 5000-5100 score checking routines

One hundred and eighty!



4000-4040 machine's user input
 7000-7040 and game routine
 7100-7040 password routine
 8000-8050 and game inputs
 9000-9040 name and load routines
 9100-9150 help page
 9900-9950 exit screen data
 routine

Variables
 000, 001 score and
 002, 003 highest checkout
 004, 005 highest score
 006, 007 graphics output (5000)
 008 player 1's name
 009 player 2's name
 010 player 1's score
 011 player 2's score
 012 player 1's last score

003 player 2's last score
 004 currently used as loop
 005 number of 501's for player 1
 006 number of 501's for player 2
 007 player 1's score input
 008 score used by player 1
 009 score used by player 2
 010 difference between two scores
 011 winning score and data for password
 012 scored average
 013 screen position in password routine
 014 holds password input
 015 holds graphical version of password
 016 input for darts used by player 1
 017 input for darts used by player 2


```

0010 IF DS="F" AND S1:178 THEN G
0011 LEAD
0012 IF DS="-" THEN GOTO 1807
0013 IF DS="0" THEN GOSUB 3380
0014 IF S1:12 THEN GOTO 1318
0015 IF DS="0" AND NOT UAL DS:5
0016 THEN GOSUB 3788
0017 IF DS="F" THEN GOTO 3880
0018 IF DS:11:32 AND CODE
0019 S1:1:55 AND S1:1:5" AND DS:1:F
0020 THEN GOTO 1807
0021 IF CODE DS:30 OR CODE DS:4
0022 7 THEN GOTO 1808
0023 IF UAL DS:188 THEN LET DS:1
0024 1
0025 IF UAL DS:188 THEN GOTO 388
0026 IF S1:UAL DS:2 THEN GOTO 18
0027 0
0028 LET S1:UAL DS
0029 LET S1:UAL DS
0030 IF UAL S1:RI THEN GOTO 1808
0031 GOSUB 3888
0032 RETURN
0033 LET US=RS
0034 LET RI=UAL DS
0035 GOTO 1808
0036 GOSUB 3888
0037 IF S1:178 OR S2:181 OR S2:4
0038 18 THEN GOSUB 788
0039 PRINT AT S1:8,DS:," ENTER Y
0040 OUR SCORE."
0041 INPUT RS
0042 IF DS="0" AND S2:178 THEN G
0043 0
0044 IF DS="F" AND S2:178 THEN G
0045 0
0046 IF DS="-" THEN GOTO 3888
0047 IF DS="0" THEN GOSUB 3888
0048 IF DS="0" AND NOT UAL DS:5
0049 5 THEN GOSUB 3788
0050 IF DS="F" THEN GOTO 3888
0051 IF DS="0" THEN GOTO 3888
0052 IF DS="0" AND CODE
0053 S1:1:55 AND S1:1:5" AND S1:1:F
0054 THEN GOTO 3818
0055 IF CODE DS:33 OR CODE DS:4
0056 7 THEN GOTO 3818
0057 IF UAL DS:188 THEN LET TS:1
0058 1
0059 IF UAL DS:2 THEN GOTO 3188
0060 IF UAL DS:188 THEN GOTO 318
0061 8
0062 IF S2:UAL RS:2 THEN GOTO 38
0063 8
0064 LET L82=UAL RS
0065 LET S2:32=UAL RS
0066 LET L83=UAL RS
0067 LET S2:33=UAL RS
0068 IF UAL S2:RI THEN GOTO 3188
0069 GOSUB 3888
0070 RETURN
0071 LET RI=UAL RS
0072 LET US=
0073 GOTO 3888
0074 1807
0075 PRINT AT 18:8,"D.R. PLAYER
0076 ENTER YOUR NAME."
0077 PRINT AT 18:8,"(MAX 8 LETTER
0078 S)"
0079 INPUT NS
0080 IF LEN NS:8 THEN GOTO 3818
0081 PRINT AT 18:12,"0"
0082 INPUT RS
0083 IF RS="0" THEN GOTO 3888
0084 IF LEN S2:8 THEN GOTO 3888
0085 RETURN
0086 IF S2:8 THEN GOTO 7888
0087 IF S2:8 THEN GOTO 7888
0088 RETURN
0089 PRINT AT 8:8,"SORRY, NO TWO
0090 NAMES THE SAME ..."
0091 SLOW
0092 FOR F=1 TO 55
0093 NEXT F
0094 FOR
0095 GOTO 3888
0096 LET S1:UAL US

```


Ventures

Welcome once more to Ventures, H&W's regular delve into the exciting world of adventure and movement (aside adventures). I am writing from these dark domains, with only my office secretary Gordon to help me.

This week I shall be looking at Castle Blackstar, The Sorcerer of Claymouge Castle, Tir Na Nog and, finally, a retrospective of Kentilla and Return to Eden. There is help with Level 9 Games, Paganware and Knight Lore.

As I struggle to write, Castle Blackstar was originally released in the September of 1984, by DCB Adventures, for an 8-level computer. Now DCB is marketing it, in new packaging and with a new price — much better at £6.95. It is now only one in the classic adventure mould — you wake up one day in a luxurious room, as is told by Lady Arctura, a beautiful woman, that you must leave in a job and take a book to her. You can keep any other treasure you may find. Suddenly you are on the road to Castle Blackstar, surrounded on all sides by trees.

I walked along, and after an unpleasant encounter with a difficult-to-map forest, I found and entered the castle. It is quite a big place with enough problems to keep most people going yet I found them maybe just a bit too simple. Presentation is very close — better than even Level 9 — and though the descriptions are nothing to write home about, they are adequate and sometimes display humour. Vocabulary is good. Strangely, QUIT breaks the computer — RESTART performs the function I was expecting, although the entry does not tell you this. Help is available from DCB by post.

Castle Blackstar is a very traditional program which has nothing special or new to offer. However, it is cheaper. This may and is quite like maybe a good game for those new to text-only adventures, or those waiting for the next Level 9 game Ventures release XXXX. As present available for the Spectrum and MSX, other computers soon.

A good sort of movement is what Tir Na Nog has to offer.

The title is Castle for Land of Ygg, the Celtic Other World. You play the great Hero Cuchulainn, who is now dead and trying to rescue the fair princess of the land of Chan. The castle, travelling through the land, seeking help from the more happily subsistent and avoiding the evil men. There is a very large network of paths crossing fens, plains, moorlands and wet waters, all the way of things you expect in a game like this. Objects lie around the floor and there are seemingly thousands of doors all leading to a different area of the land. Some need a key, naturally.

Where the game search can from the rest is its graphic quality and quantity. There is very little text, most of the screen being devoted to a beautiful, full colour picture to the scene of the is the Hero, and as you walk left or right the scene scrolls accordingly, to reveal yet more game graphics.

The program's producer, Georgey Games, describes Tir Na Nog as a computer movie, and this it, for a change, a justified claim. Cuchulainn is wonderfully animated, seven characters high with hair flowing back due to its unseen wind. It's similar to controlling a cartoon.

However (who does these things have to be a hero?) good graphics do not make a good game. I have several prizes. Firstly, I was annoyed by all mothers refused to lend me any small tape recorder. Then I discovered it was not on pressing the wrong key, or was due to an impossible loss (the happened several times). However, a difficult, due to being so filled with changing 'camera angles', and taken a lot of practice.

Above all, the control seemed to lose many of the people I shared the game to. Moving around the paths, which all look similar, takes ages and is difficult. Maybe mapping would help, but I felt the program lacked sufficient incentive for the player to carry on.

It seems to be an Ultramic role box with a very readable (perhaps) headline, from Georgey Games of Birmingham. So far only available on the Spectrum, Tir Na Nog costs £7.95. Ventures rating: XXX — interesting.

Peter Sweasey discusses Castle Blackstar, The Sorcerer of Claymouge Castle and Tir Na Nog. He looks back at Kentilla and Return to Eden and gives you clues on other adventures

Good. Adams is the jolly proclaimed King of Adventures. Certainly his Adventureland helped set the ball rolling all those years ago. After the Hulk and Spectrogon he returns to more familiar

adventure territory with Sorcerer of Claymouge Castle. You play Bramwell, a wizard's apprentice who must penetrate Claymouge Castle and retrieve the 13 years of power, captured by evil Vilevich. You carry with



ADVENTURE SPECIAL

you a selection of masterfully named spells, the first of which you can almost do just. Being a more approachable though, some of the results are unpredictable.

If your computer has sufficient memory there are some excellent graphics. Text, however is short, and there are not very many bonuses. As with most Scott Adams games, the main feature is the numerous application of intriguing, difficult puzzles, which are fun to try to solve. Vocabulary is limited, but even presentation good better than The Hobbit.

Although competently programmed, *Sorcerer* is not really worth £9.95 in my opinion. There are many better adventures out with more interesting features. If you like pretty pictures, or really want some very tricky puzzles, maybe it's worth it. Otherwise, *Venues* rating of only 5XN. Published by Adventure International, available for many major home computers.

If you have £10 to spare and want a really good adventure, the best buy must be the amazing *Romans to Eternity* from Level 9. Level 9 is an adventure where *Ultimate* are to

apartures — simply superb. The program has been reviewed previously in the main magazine, so I shall not repeat what we said then.

Similar to say it is pure enjoyment, with a third and intelligent plot. The action unfolds in the best way, you can now type in several commands in a row and watch the result on screen. Vocabulary and sentence construction are both very good, and descriptions are, at least, as good as a novel. It comes with full mortgage booklet and as a large box. I am also glad to say the program has had a wider distribution than this issue hopefully even more people will become hooked. *Venues* rating 5XNXX — performance? £9.95 for most home computers.

A cheap review in my opinion, at *Kavala* £8.99 for the *Sorcerer* from *Microware*. This was also reviewed in the main magazine, but the first I disagree with my colleague. Although the game introduces some welcome innovation, it has some much more serious flaws. All this is a surprise since the game is written by David Brewster, a fellow adventure critic.

Finally the winning it, in again, a middle earth, sword and sorcery type, with usually forgettable names like *Gothic*, *Andra* and *Alarich* clashing up the story. Looking back in age, the high frequency would not work on my normal monitor — and once as I remained unimpressed. Two is far too brief, particularly as I found it dull. However, the main flow is the major routine. Although a difficult game complex feature it found is very hard to see, since it will not accept my relatively fast typing pace. For example, I used typing INVENTORY and IVETRY appeared on the screen? Although a well accept alternatives to two letters, I will find to pause between each letter. Very frustrating! Screen presentation is poor, also, with absence of visual hints.

It is one of the cheapest graphic games around though. Still I'm afraid the *Venues* rating is 5XN — poor. Maybe the publisher deserves a warning to me for *Gothic*, that's never comprehensively if you do.

Now the helpdesk. Giving help with Level 9 games always seems to spoil the fun, but if

Sorcerer brought you letters to show you may be stuck. Well, for those who have given up very early, make this an *Adams* favourite place! These in passages being reworked with *Trilobite* and a rest — but are you carrying what's needed for a comfortable income? For three stages the game becomes even better.

Pyramania is not meant some people problems. The subject is in the box — but for free word the question keys to make the match better. This in turn will lead you to the library book — take the screen and with a little help you can learn to the best way.

Knights Love, which I suspect was dropping down *Pyramania* in vast numbers this time, also requires careful thought. The objective is to keep the required objects in the wizard's collection — but each *Pyramania* can see what is needed to will appear in the "break." Some rooms look empty, but when objects are hidden under blocks which vanish when jumped on.

That's it for this week — I will get us your letters eventually — So keep writing, with help, for help, or to express your opinion.

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Grand prix



The race is on! Overtake all the competitors — but watch out for oil slicks — in Colin Ashworth's game for the TI-99/4A with Extended BASIC

Take your place behind the wheel for this fast-moving racing game for the TI-99/4A with Extended BASIC.

After the introduction, you will be asked to choose your skill level, which is from one to three. One is the easiest and three the hardest.

Now the screen clears and the track is set up. Your car appears at the bottom of the screen and you must overtake all the other cars — but watch out for oil slicks!

You must race as far as you can without crashing. If you find the game is too fast, alter the speeds in lines 140, 150 and 160.

If you crash, the screen clears and prints your score as well as the highest score to date.

How to modify

200-270 define characters
280-290 define colours
330-330 set up screen
340-340 set up oil slicks
370-380 set up cars
390-400 move car
410-420 acceleration
430-470 set random
480-500 set oil slick level
510-600 crash routine, end car
on go
610-690 crash into barrier
routine
set up of game
700-970 print statistical analysis

Variables

LOCHEX: random position
of cars
A1 to A4: scoring cars
A5: your racing car
A6: A8: oil slicks

```
100 REM DEFINE CHARACTERS
110 CALL CHAR(33,"1AGF55CEBDSAGF
1A")
120 CALL CHAR(40,"FFFFFFFFFFFFFF
FF")
130 CALL CHAR(128,"1F101F01C3FCF
3C8088F8F8EF011F1FF808F880433F9
F890171F17F7808F8")
140 CALL CHAR(132,"1F101F01C3FCF
BC088EF8F8EF011F1FF808F880499F9
F880571F17F7808F8")
150 CALL CHAR(136,"1F101F01C3FCF
9C8088F8F8EF011F1FF808F880433F8
F880575F17F7808F8")
160 CALL CHAR(140,"3C7EFFFFFFFFF
EDC")
170 CALL CHAR(124,"34999D4585AC7
C8F7EFF7EFFD8425149")
```



```

180 GOSUB 400
190 CALL COLOR:1,13,1:
200 CALL COLOR:2,16,1:
210 CALL CLEAR:1: CALL SCREEN:4:
  :: CALL MAGNIFY:3: :: SCORE=0
220 REM SET UP SCREEN
230 CALL VCHAR:1,7,33,24:1: CALL
  VCHAR:1,26,33,24:1: FOR I=8 TO
  25:1: CALL VCHAR:1,1,40,24:1: NE
  XT I
240 REM SET UP OIL SLICKS
250 CALL SPRITE:85,128,2,155,117
  ,0,0:1: FOR I=1 TO 100:1: NEXT I
260 RANDOMIZE:1: I=INT(RND*SPEED
  4)+SPEED:1: B=INT(RND*SPEED4)+S
  PEE1:1: C=INT(RND*SPEED4)+SPEED
  1
270 CALL SPRITE:85,140,2,1,80,1,
  0,47,140,2,1,120,5,0,88,140,2,1,
  155,0,0:
280 REM SET UP CAR:
290 RANDOMIZE:1: D=INT(RND*SPEED
  4)+SPEED:1: E=INT(RND*SPEED4)+S
  PEE1:1: F=INT(RND*SPEED4)+SPEED
  1:1: G=INT(RND*SPEED4)+SPEED1
300 CALL SPRITE:81,132,11,1,60,D
  ,0:1: CALL SPRITE:82,136,5,1,100
  ,E,0:
310 CALL SPRITE:80,132,13,1,130,
  F,0:1: CALL SPRITE:84,106,7,1,17
  5,G,0:
320 REM MOVE CAR
330 CALL KEY:0,K,S:1: CALL COINC
  "ALL,P:1: IF R=-1 THEN 770
340 CALL POSITION:45,E,J:1: IF J
  <5 THEN 840 ELSE SCORE=SCORE+1
350 CALL POSITION:45,E,J:1: IF J
  >190 THEN 840 ELSE SCORE=SCORE+1
360 IF SCORE<=SCORE THEN 370 Els
  E 390
370 HSCORE=SCORE
380 IF S=-1 THEN 330
390 CALL COINC:ALL,C:1: IF C=-1
  THEN 770
400 IF S=0 THEN CALL MOTION:85,0
  ,0:1: GOTO 330
410 IF I<44 OR I>46 THEN 330
420 CALL MOTION:85,0,K,45+SPEE
  D5:1: CALL COINC:ALL,C:1: IF C=-
  1 THEN 770 ELSE 330
430 CALL MOTION:85,0,(K-45)+40:1
  : CALL COINC:ALL,C:1: IF C=-1 TH
  EN 770 ELSE 330
440 GOTO 330
450 REM INTRODUCTION
460 CALL CLEAR:1: CALL SCREEN:16
  :

```

```

470 DISPLAY AT:12,5:1:"G R A N D
  P R I X":1: DISPLAY AT:12,5,1:
  "*****"
480 DISPLAY AT:14,14:1:"B Y":1: D
  ISPLAY AT:15,14:1:"***"
490 DISPLAY AT:16,0:1:"COLIN ASHV
  ORTH":1: DISPLAY AT:17,8:1:"*****
  *****"
500 FOR N=1 TO 4
510 CALL SOUND:80,220,8,-5,0:1:
  CALL SOUND:60,220,8,-5,5:
520 NEXT N
530 FOR F=1000 TO 2000 STEP 15
540 CALL SOUND:-99,111,30,111,30
  ,F,30,-8,0:
550 NEXT F
560 FOR F=1 TO 30
570 CALL SOUND:-99,111,30,111,30
  ,4000,30,-8,0:
580 NEXT F
590 CALL CLEAR:1: FOR I=1 TO 400
  :1: NEXT I
600 DISPLAY AT:12,1:1:"DO YOU WAN
  T INSTRUCTIONS":1:
610 CALL KEY:0,K,S:1: IF S=0 THE
  N 600:1: IF I=99 THEN 640 ELSE 8
  90
620 FOR I=1 TO 400:1: NEXT I
630 REM INSTRUCTIONS
640 CALL CLEAR:1: DISPLAY AT:12,
  1:1:"YOU HAVE TO TRAVEL AS FAR AS
  YOU
  CAN BEFORE YOU CRASH."
650 DISPLAY AT:16,1:1:"AVOIDING O
  IL THEM CAR:OIL
  SLICKS AND BARRIER
  S."
660 DISPLAY AT:20,1:1:"USE THE
  ' ' AND ' ' KEYS TO
  MOVE."
670 DISPLAY AT:24,1:1:"PRESS ANY
  KEY TO CONTINUE...":1: CALL KEY:
  0,K,S:1: IF S=0 THEN 670:1: IF K
  <3:1: THEN 890 ELSE 670
680 REM SKILL LEVEL
690 CALL CLEAR:1: FOR I=1 TO 400
  :1: NEXT I:1: DISPLAY AT:12,5:1:"
  SKILL LEVEL 1: TO 33"
700 CALL KEY:0,K,S:1: IF S=0 THE
  N 700
710 IF K<49 THEN 720 ELSE 740
720 IF K<50 THEN 730 ELSE 750
730 IF K<51 THEN 700 ELSE 760
740 SPEED1=5:1: SPEED2=15:1: SPE
  ED3=25:1: SPEED4=35:1: SPEED5=20
  :1: GOTO 190
750 SPEED1=10:1: SPEED2=20:1: SP

```



```

880Q=30 :: SPEED4=40 :: SPEED5=2
7 :: GOTO 190
760 SPEED1=15 :: SPEED2=25 :: SP
880Q=35 :: SPEED4=45 :: SPEED5=3
5 :: GOTO 190
770 CALL SOUND(1000,=5,0):: FDF
I=1 TO 9 :: CALL MOTION=31,0,0::
NEXT I :: CALL PATTERN=95,124:
:: FDF A=1 TO 500 :: NEXT A
780 CALL CLEAR :: CALL SCREEN=1:
790 CALL DELSPRITE(ALL):
790 PEN CRASH
800 FDF I=1 TO 400 :: NEXT I ::
DISPLA: AT:12,4:"YOU CRASHED /D
UP CAR"
810 DISPLAY AT:16,5:"YOUR SCORE
I":HSCORE
820 DISPLAY AT:20,8:"HIGH SCORE
I":HSCORE
830 DISPLAY AT:24,1:"PFESE SPAC
E BAR TO CONTINUE" :: CALL KEY/O
(,1,5,0) :: IF S=0 THEN 820 :: IF P=
32 THEN 890 ELSE 830
840 CALL SOUND(1000,=5,0):: CALL
CLEAR :: CALL DELSPRITE(ALL)::
CALL SCREEN=16:: FDF I=1 TO 400

```

```

:: NEXT I
850 PEN CRASH
860 DISPLAY AT:12,1:"YOU RAN IN
TO THE HERGE?" :: DISPLA: AT:16,
5:"YOUR SCORE I":HSCORE
870 DISPLAY AT:20,8:"HIGH SCORE
I":HSCORE
880 DISPLAY AT:24,1:"PFESE SPAC
E BAR TO CONTINUE" :: CALL KEY/O
(,1,5,0) :: IF S=0 THEN 820 :: IF P=
32 THEN 890 ELSE 830
890 CALL CLEAR :: FDF I=1 TO 400
:: NEXT I
900 DISPLAY AT:12,1:"THE FACE I
S ABOUT TO START"
910 PEN NATIONAL ANTHEM
920 RESTORE #40
930 READ S-A :: IF A=0 THEN 970
:: CALL SOUND(A,8,0):: GOTO 940
940 DATA 392,800,592,300,440,300
,370,450,392,150,440,300
950 DATA 494,900,494,300,512,300
,494,450,440,150,992,300
960 DATA 440,300,392,300,270,300
,392,900,0,0
970 GOTO 690

```

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PROGRAM CORRECTION

Technical niche

Due to production delays, the first 100,000 units of the 1997 model will be shipped in January. The 1997 model will be shipped in January. The 1997 model will be shipped in January.

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Number Pointer

AGE, London House, 48 Viper
Richmond Rd, London SW13

Doing a long run towards success is no fun. The award-winning educational games and educational software, this program aims to improve your speed at mental arithmetic.

With a self test option, the most serious enemies of a game using a screen covered in numbers and numbers, along with pictures, lead to the guided in math students and memory operators. A target figure is displayed in the top of the screen along with a continuously updated total.

Your efforts are rated on a scale in the shape of a bucket of points. This is headed up the side

of the screen on a spot, and spelled all over the display if you run out of time.

Written for children aged from five to 14 years, there are 40 different levels of play available.

Initially choosing the level, who makes to work, will quickly encourage you to the rules of play. You must use the keypad to find when the self test results show an improvement in accuracy.

A pleasing score display indicates that a heightened rate of learning to overcome necessary difficulty subject.

education	100%
playability	70%
graphics	100%
value for money	80%



Bingo CBM 64 £8.95

System: Complete Software,
Addison Ltd Ltd, Basingstoke, Hants
RG24 0JH

Does after playing this game several times I feel nothing is more difficult. I am sure everyone knows the game, but just in case I'll better explain it. You have a board covered 25 numbers, which you cross off when they are called. The first person to cross a line in any direction or the four corners of the board wins.

This program allows you to play four boards and keeps you the option to use the Capital Sports 64 to call the numbers. You have the further option of

up to 99 people playing. However, as you can only see four cards displayed, this creates unusual problems.

The screen is a set of numbers. Should your card was called your lucky numbers match, you could go on to win real money. You have to record your party on the screen of the guests and send a call to yourself as he entered in the crowd's draw.

All things considered, I can't say the price in this program. Although waiting to play longer and finding lost game cards, with various prices.

education	100%
playability	100%
graphics	100%
value for money	100%



QL-Chess Sinclair QL £19.95

Stanley Bowerth, Southgate Rd,
Camberley, Surrey

More often than not, the only commercial software for a new computer is a machine. From has changed all this with QL-Chess. There is only one way I can describe it — beautiful.

It plays a very powerful game of chess, a copy the recent World Microcomputer Chessplayer, so it should provide a reasonable challenge for most mortals. There are 26 levels of play, and even at the lowest it's hard to beat. If you find a game difficult, QL-Chess is kind enough to advise you when to do so.

The range of features offered are impressive. It has a vast array of opening moves, or you can set up your own last position, play against the clock, or look through a game on analysis screen, which a program of game review, first and last games, etc, etc.

The most impressive feature is surely the 16 chess board. You can almost believe that you're looking at a real board. Moving pieces is a matter of touch and screen graphics show your game in the required square.

The pack also comes without secondary QL-Chess as an outstanding program in every way. It's a 16-chess work sheet? £19.95.

education	100%
playability	100%
graphics	100%
value for money	100%



Lucky dip

A mixed bag of programs here,
our reviewers give their
expert advice

Prediction Birthday File CBM 64 £12.95

Stanford Press, Lock Hill, West
Isle, Poole, Dorset

This is computer's calendar and book. From the presentation of the word, Prediction in the title, and the book covered in alphabetical order, I thought it was for an interesting card.

The book is an introduction to astrology and astrology from you can get ideas from naming a birthday and then compare it. This is fine but what a disaster it is for the package in that you need several other books and special paper before you can start.

The book is well written, but very tedious and quite difficult

for a beginner. The book up on the back of the two pages that together the book and program provide a complete astrological workshop and I expected to be able to input relevant data, then go back to the book for interpretation. Instead, all the charts generated was a very slow loading birthday file into which you can store details of friends' birthdays.

The calendar was so slow to load that it would be quicker writing the birthday in a book. Overall, an expensive waste of time.

education	60%
playability	100%
graphics	100%
value for money	20%



PCW Games Collection CBM 64 £4.95

Century Communications, Park
Road Wey, GU1 0TW, Wey,
London NW1 5LE

This is a package of 26 programs, all of which have been published in Personal Computer World and are here gathered up in one package and in a book of the same name.

The price is quite low for such a lot, though some of the favorites, so being Side 1, game 1, is a fairly cute game which I found so difficult that I soon turned on. Also on the disc were two word games, and a word search puzzle and the other 23 included in word search puzzle. There are also three other chess games, and the space that you can find favorites for you in my old favorites list and a fairly good version of Monopoly, as Omaha and Gomoku, which is a 3-in-a-row simple and classic.

Back when you purchased with game software could be able to find something in there were some were a version of Mahjong, a chess game, and a new game called Spirit. This game involved clearing the columns of squares, and eventually leaving them on them.

education	100%
playability	100%
graphics	100%
value for money	100%



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15500, 15600, 15700, 15800, 15900, 16000, 16100, 16200, 16300, 16400, 16500, 16600, 16700, 16800, 16900, 17000, 17100, 17200, 17300, 17400, 17500, 17600, 17700, 17800, 17900, 18000, 18100, 18200, 18300, 18400, 18500, 18600, 18700, 18800, 18900, 19000, 19100, 19200, 19300, 19400, 19500, 19600, 19700, 19800, 19900, 20000, 20100, 20200, 20300, 20400, 20500, 20600, 20700, 20800, 20900, 21000, 21100, 21200, 21300, 21400, 21500, 21600, 21700, 21800, 21900, 22000, 22100, 22200, 22300, 22400, 22500, 22600, 22700, 22800, 22900, 23000, 23100, 23200, 23300, 23400, 23500, 23600, 23700, 23800, 23900, 24000, 24100, 24200, 24300, 24400, 24500, 24600, 24700, 24800, 24900, 25000, 25100, 25200, 25300, 25400, 25500, 25600, 25700, 25800, 25900, 26000, 26100, 26200, 26300, 26400, 26500, 26600, 26700, 26800, 26900, 27000, 27100, 27200, 27300, 27400, 27500, 27600, 27700, 27800, 27900, 28000, 28100, 28200, 28300, 28400, 28500, 28600, 28700, 28800, 28900, 29000, 29100, 29200, 29300, 29400, 29500, 29600, 29700, 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